

## Our expertise in biogas

- Qualified advice
- Extensive, detailed analysis
- SILASIL ENERGY® – specialized silage additives
- BC.ACID – successful preservation products
- BC.concept and CR.concept – fermenter-specific, individual micronutrient mixtures

## The result: more profit for you

- Optimal ensiling and substrate preservation
- Long-term increase in fermenter efficiency
- More full-capacity hours per year
- Higher company profit

# We research for you:

From batch trials to the 500 kW biogas plant

From model silo to commercial silo facility (12,000 t)



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**SCHAUMANN** Expertise in Biogas  
**BIOENERGY**

## We research for you

With the construction of the new biogas plant at the Hülseberg farm the SCHAUMANN research division has enhanced its facilities for handling complex activities relating to biogas production.



Fermentation acid analysis by HPLC

From basic research in batch fermenters and trials in continuous fermenter stations through to field studies in parallel working commercial fermenters, the Hülseberg research centre has created outstanding facilities for resolving complex issues relating to biogas production:

- Optimisation of fermentation processes in biogas plants
- Continuous updating of trace element requirement data
- Testing new combinations of active agents and product formulations for tailor-made micronutrient mixtures which provide a long-term increase in fermenter efficiency while reducing environmental impact.



Biogas batch testing facility



Optimal face area of a maize silo

## Ensiling and substrate preparation

A key aspect of profitable biogas production is optimal substrate preparation and professional ensiling of the energy plants. This is something we have been working on with a high degree of success for more than 15 years.

SCHAUMANN scientists select special lactic acid bacteria which are combined in accurately balanced ratios in speciality products which ensure optimal fer-

mentation of the ensiled material, preserve the energy content of the plants and increase the efficiency of biogas production. This applies both to pure biogas substrates and to substrates for universal application (livestock feeding and biogas production).

Outstanding results in practice testify to our successful research and development work.

## Optimising the fermentation processes

In recent years SCHAUMANN scientists have intensified their research work into the fermentation processes of biogas factories.

This started with studies in a test facility with 48 batch fermenters on a 60-litre scale and 28 fermenters on a 30-litre scale. Fermentation of 300–500 g material allows representative samples of heterogeneous substrates to be drawn without prior processing. The trials were conducted in conformance with VDI Guideline 4630 in four batches.

### Study objectives:

- Effect of aerobic losses in the substrate store on the biogas yield
- Rate of degradation and residual fermentation potential
- Degradation kinetics and metabolic pathways during anaerobic breakdown using the in sacco method and feed batch trials

## 500 kW biogas facility at the Hülseberg farm

In order to investigate the transferability of the results from model trials to practical biogas production the SCHAUMANN research division decided to build a 500 kW field test biogas facility at Hülseberg.

The factory has two identical commercial-scale fermentation lines, each of

which can run one test with a control.

Comprehensive research and analytical facilities in modern in-house research laboratories create the basis for optimising fermentation processes and increasing substrate degradation rates.



Biogas facility at Hülseberg



ICP analysis for trace element determination

### Key data of the biogas facility:

- 2 x 250 kW total electrical output
- 4,800 m<sup>3</sup> total fermenter volume
  - 2 x 1,300 m<sup>3</sup> main fermenters
  - 2 x 1,100 m<sup>3</sup> secondary fermenters
- 2 identical but separate process lines, each with a main and secondary fermenter and gas-tight terminal store with separate balancing
- Separate gas volume and quality measurement in all containers
- Emission measurements